## Dynamics of Wetting and Spreading and the Precursor Film

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The contribution will review statistical-mechanical modeling of the statics and dynamics of wetting and spreading. The focus will be on lattice gas and related solid-on-solid (SOS) models and their contribution to the understanding of interface fluctuations, line tension, contact angles and the Wulff phenomenology of sessile droplet shape. Finally, dynamics of wetting and spreading will be discussed. The recent experimental advances made by the groups at the College de France and in Lyons required the notion of a precursor film about one molecule thick for their explanation. This stimulated theorists to discover spreading models manifesting precursor films. The first such model was the horizontal SOS with Langevin dynamics. This has linear long time asymptotic behaviour, in disagreement with the experimental finding of diffusive growth of the precursor film. The driving force for the spreading is the strong van der Waals bonding between the surface (a silicon wafer) and the spreading molecules (typically silanes of quite high molecular weight). The preliminary linear growth can be thought of as an extrusion from the reservoir to form a template for the precursor film. Subsequent growth occurs by diffusion of molecules in a dilute gas forming a supernatant layer above the precursor. When supernatant molecules reach the edge of the precursor they fall onto the surface of the substrate, essentially irreversibly under the strong downwards van der Waals force. Strong support is lent to this picture by Monte Carlo simulations of the associated lattice gas model and by a Molecular Dynamics study with Lennard-Jones potential, the substrate being treated as a continuum and the spreading molecules as structureless spheres.